DATA STRUCTURES

1 LAB 1

2 Write a program to simulate the working of stack using an array with the following:
a) push b) pop c) Display. The program should print appropriate messages for stack Overflow, stack underflow

Code:

```
#include<stdio.h>
#define N 5
int stack[5], top=-1;
void push()
{
  int x;
  if(top==(N-1))
  {
    printf("\n stack Overflow");
  }
  else
  {
    printf("\n Enter the number to be inserted");
    scanf("\n%d", &x);
    top++;
    stack[top]=x;
  }
}

void pop()
{
  int itm;
```

```
if (top == -1)
{
  printf ("\n Stack underflow");
}
else
{
  itm = stack[top];
  printf ("The element popped is \n %d", itm);
  top--;
}
}
void display()
{
  int i;
  if (top >= 0)
  {
    for (i=top; i >=0; i--)
    {
      printf ("\n %d", stack[i]);
    }
  }
  else
    printf ("\n The stack is empty");
}
void main()
{
  int choice;
  do {
  printf ("\n Enter these keys for the following ops 1. push 2. pop 3. disp
          4. exit");
  scanf ("\n %d", &choice);
```

```
switch (choice)
{
  case 1 :
  push();
  break;
  case 2 :
  pop();
  break;
  case 4 :
  exit(0);
  break;
}
} while (choice != 4);
}
```

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Output:

Enter the keys for the following ops 1. push 2. pop 3. display 4. exit 1

Enter the number to be inserted 21

Enter these keys for the following ops 1. push 2. pop 3. display 4. exit 3

21

Enter these keys for the following ops 1. push 2. pop 3. display 4. exit 2

The element popped is 21

Enter these keys for the following ops 1. push 2. pop 3. display 4. Exit

Process returned 0 (0x0) execution time : 17.516 s.